

REMARKS

Status of the Application

Claims 1-7 and 9-20 have been examined. After entry of this amendment, claims 1-7 and 9-25 will be all the claims pending in the application.

Formal Matters

Applicant thanks the Examiner for returning the initialed PTO/SB/08 form of May 2, 2008, and for indicating consideration of the references thereon.

Applicant respectfully requests the Examiner acknowledge the claim of foreign priority and receipt of the certified copy of the priority document. Applicant notes that claims 19 and 20 were addressed in the body of the Office Action of July 1, 2008, but do not appear on the corresponding PTOL-326 form or Index of Claims. Applicant has responded as if the claims appeared on the corresponding forms.

Added Claims

Applicant has added claims 21-25 to more particularly claim aspects of the invention disclosed but not previously claimed.

The invention disclosed in the Doi reference performs classification by obtaining histograms of pixel values for each pixel within an inner region and an outer region. In contrast, the invention of the present application performs classification by obtaining histograms of the frequency at which density patterns (textures) appear within the small regions that constitute the inner and outer outline images. The present invention differs from the invention of Doi in this point. Applicant has added claims to clarify this

difference and respectfully submits the added claims are fully supported by the specification and do not constitute new matter. Support for the added claims is found in at least page 21, line 14 to page 24, line 10.

Abnormal patterns include those that have characteristic features in the vicinities of the outlines thereof, such as spicula. In the case that these types of patterns are classified, it becomes important to pay attention to the textures in the images of the vicinities of the outlines. In the invention disclosed by Doi, in which the frequency of appearance of pixels of images within an outline and pixels of images outside the outline is used for classification, this type of pattern *cannot be classified*. On the other hand, the invention of the present application employs the frequencies at which the density patterns appear within the small regions of the inner and outer outline images, and therefore is capable of classifying types of patterns that have characteristic features in the vicinities of the outlines thereof.

Claim Rejections - 35 U.S.C. § 102

Claims 1-7 and 9-20 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Doi *et al.* (U.S. 2002/0172403, hereinafter “Doi”). Applicant traverses and respectfully submits the claims are patentable for at least the following reasons.

Claim 1 recites in part:

a candidate region extracting means for extracting candidate regions for predetermined patterns from medical image data;

an inner/outer outline image extracting means for extracting inner/outer outline images corresponding to an inner/outer outline region, which are in the vicinity of the outline of the candidate regions extracted by the candidate region extracting means; and

a pattern judging means for judging the type of pattern within the candidate regions, by employing characteristic amounts of the inner/outer outline image extracted by the inner/outer outline image extracting means;

wherein the inner/outer outline region includes the entire outline of the candidate regions.

Applicant respectfully submits that Doi fails to teach the above features regarding an inner/outer outline image extracting means. The Office Action cites Fig. 5a-5f, which show an inside and outside region of the segmented nodules, to allege that this feature is disclosed (Office Action, page 2). Applicant submits that there is no extraction of inner/outline images corresponding to an inner/outer outline regions that are in the vicinity of the outline of the candidate regions extracted by the candidate regions extracting means. As featured in the claim language, the inner/outline image includes an image of an inner/outer outline region that includes the entire outline of the candidate regions.

The Office Action alleges the inside and outside regions of the six segmented nodules disclose the inner/outer regions. However, Applicant respectfully submits that Figs. 4a-4f illustrate nodule segmentation of the images of Figs. 2a-2f by automated nodule segmentation. Figs. 5a-5f, on the other hand, display an inside and outside region within the segmented nodules (paras. 43, 44, and 65). There is no disclosure that there is a link between the *outline of the candidate regions* that is extracted by the candidate regions and an inner/outer image. Doi merely teaches *that a digital image with a module location is identified*. (Fig. 10, S10). A different image is formed allowing for determination of nodule outline and the automated segmentation allows for an

approximate region that allows for subsequent analysis (para. 63). Therefore, the nodule is segmented to determine its outline (para. 63). Within the segmented nodule there is an outer and inner region (para. 65). Accordingly, even an analysis of the segmented nodule is considered an extraction, the extraction is limited to the inside and outside regions of Doi.

Therefore, an extracted inner/outer outline region cannot exist in *the vicinity* of the candidate regions (the outline of the nodule in Doi), because at most the *outside region* of Doi is extracted. If that is the condition, then the inner/outer outline region would have the *same* outside edge as the outline of the candidate region, instead of being in the vicinity of the candidate regions. Accordingly, if only the *inside region* is extracted, then the outline of all of the candidate region would not fall within the inner/outer region.

In view of the above, Applicant respectfully submits that claim 1 is patentable over Doi. Claims 2-6, 10, 11, 16 and 19-20 are patentable at least because of their dependency from allowable claim 1. Claims 7 and 9 are patentable at least for reasons similar to claim 1 as claims 7 and 9 recite features that are analogous to those of allowable claim 1. Dependent claims 12-15 and 17-18 are allowable at least by virtue of their dependency on the corresponding allowable independent claims and for reasons analogous to those for claims 10-11 and 16.

Furthermore, with respect to features of claim 5, the image of the extracted inner/outer regions is extracted. Accordingly, the extracted region is divided into the (3) claimed regions. The Office Action alleges that Fig. 5a of Doi illustrates three different

regions (Office Action, page 5). However, the Applicant respectfully submits that the Office Action fails to explain how these 3 different regions would be extracted or how the limit for extraction of the outer most alleged region would be set.

At best, unextracted, the inside region can serve as the first region, the outside region can serve as the second region, and outside the outside region could be a third region. However, there is no disclosure of *an extraction outside the outside region*. Accordingly, the region outside the outside regions could not be extracted to be part of an inner/outer region of the claimed invention. Doi, at best, teaches segmentation (and extraction) of the nodule to the outside region. Therefore, as there is no analysis or segmentation outside the outside region of the nodule, at best under the Office Action's interpretation, Doi teaches the presence of *two sub-regions* in regions which could be extracted. Accordingly, Applicant respectfully submits claim 5 is allowable for at least this additional reason.

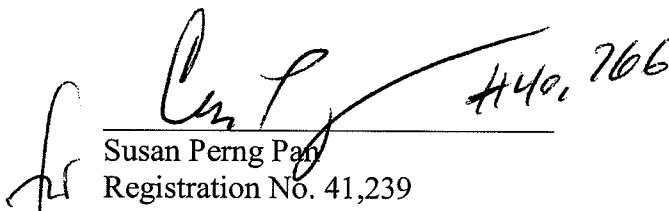
Furthermore, with respect to claim 10, as discussed above with respect to claim 5, the Office Action points to outside the outside region to allegedly illustrating the features that the "inner/outer outline region includes inward vicinity and outward vicinity of the outline of the candidate regions" (Office Action, page 5). The Office Action fails to illustrate which parts outside the outside region are extracted in an inner/outer outline image or how any limitations are set as to what is extracted apart from the outside and the inside regions. Accordingly, Applicant respectfully submits claim 10 is allowable, for at least this additional reason.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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23373

CUSTOMER NUMBER

Date: November 3, 2008